



CERTIFICATE OF TYPE APPROVAL

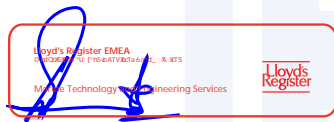
This is to certify that

Lloyd's Register did undertake the relevant type approval procedures of the equipment detailed below which was found to be in compliance with the essential Pollution Prevention requirements for use on ships and offshore installations classed with Lloyd's Register, and for use on ships and offshore installations when authorised by contracting governments to issue the relevant certificates, licences, permits, etc.

Manufacturer	SludgeHammer Group Ltd.
Address	336 S. Division Rd. Petoskey MI 49770 United States of America (USA)
Type	SEWAGE TREATMENT PLANTS (POLLUTION PREVENTION)
Description	SludgeHammer MS Series - Marine Wastewater Treatment Systems: Model No. "MS - 700"
Specified Standard	IMO RES. MEPC.159(55)

The attached Design Appraisal Document forms part of this certificate.

This certificate remains valid unless cancelled or revoked, provided the conditions in the attached Design Appraisal Document are complied with and the equipment remains satisfactory in service.

Date of issue	29 September 2014	Expiry date	28 September 2019
Certificate No.	SAS P140016	Signed	
Sheet No	1 of 4	Name	N. Siddiqui Surveyor to Lloyd's Register EMEA A Member of the Lloyd's Register Group

Note:

This certificate is not valid for equipment, the design or manufacture of which has been varied or modified from the specimen tested. The manufacturer should notify Lloyd's Register of any modification or changes to the equipment in order to obtain a valid Certificate.

Lloyd's Register Group Limited, its affiliates and subsidiaries and their respective officers, employees or agents are, individually and collectively, referred to in this clause as the 'Lloyd's Register'. Lloyd's Register assumes no responsibility and shall not be liable to any person for any loss, damage or expense caused by reliance on the information or advice in this document or howsoever provided, unless that person has signed a contract with the relevant Lloyd's Register entity for the provision of this information or advice and in that case any responsibility or liability is exclusively on the terms and conditions set out in that contract.



Page	2 of 4
Document number	SAS P140016
Issue number	1

DESIGN APPRAISAL DOCUMENT

Date	Quote this reference on all future communications
5 September 2014	MTES/MARPOL/TA/NAS/WP19162426

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS P140016

The undernoted documents have been appraised for compliance with the relevant requirements of International Conventions, and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

The equipment has been examined and satisfactory tested in accordance with the International Maritime Organisation Resolution MEPC.159 (55) to meet the operational requirements referred to in regulation 9.1.1 of Annex IV of the International Convention for the Prevention of Pollution from Ships, 1973/1978.

The equipment was tested and produced an effluent which, on analysis, did not exceed:

100 thermotolerant faecal coliform per 100 millilitre MPN, and a geometric mean of total Suspended Solids of 35 milligrams per litre.

Designed maximum hydraulic loading:	172.0 cubic metres per day
Designed maximum organic loading:	43.0 kilograms per day (BOD)

The control and sensor equipment were tested for shock and vibration.

The equipment has been designed:-

- i) so that the geometric mean of the 5-day Biochemical Oxygen Demand (BOD₅) does not exceed 25 mg/l; and the Chemical Oxygen demand (COD) does not exceed 125 mg/l and,
- i) can operate under conditions of heel of up to 22.5° and,
- ii) can operate with effluent values of 6.0 to 8.5 of the pH scale.

TEST RESULTS

Test results and details of tests conducted on a specimen of Sewage Treatment Equipment in accordance with IMO Resolution MEPC.159 (55).

Sewage Treatment Equipment, Type	MS - Prototype
Manufactured by	SludgeHammer Group Ltd
Organisation conducting the test	NovaTec Consultant Inc.
Test Location	Courtenay Regional District, Comox, British Columbia, Canada
Designed hydraulic loading	1.5 cubic metres per day
Designed organic loading	0.38 kilograms per day BOD
Number of effluent samples tested	40
Raw sewage quality	Average 618 milligrams per litre Suspended Solids
Maximum hydraulic loading	1.5 cubic metres per day (400 US Gallons per day)



Lloyd's
Register

Lloyd's Register EMEA

71 Fenchurch Street, London, EC3M 4BS

Telephone 020 7423 2416 Fax 020 7423 2053

Email med@lr.org

Page 4 of 4
Document number SAS P140016
Issue number 1

DESIGN APPRAISAL DOCUMENT

Date 5 September 2014	Quote this reference on all future communications MTES/MARPOL/TA/NAS/WP19162426
--------------------------	--

ATTACHMENT TO CERTIFICATE OF TYPE APPROVAL No. SAS P140016

CONDITIONS OF CERTIFICATION

1. A plate or durable label containing data of the manufacturer's name, type and serial numbers of the equipment, hydraulic loading and data of manufacturer is to be fitted on each unit.
2. A copy of this certificate shall be carried onboard any vessel equipped with the described unit.
3. Production items are to be manufactured in accordance with a quality control system which shall be maintained to ensure that items are of the same standard as the approved prototype.

PLACES OF PRODUCTION

SludgeHammer Group Ltd.
336 S. Division Rd.
Petoskey
MI 49770
United States of America (USA)

SludgeHammer Group Ltd. – Compressor Services
1160 MacBride Park
Harbor Springs
MI 49740
United States of America (USA)



Nouman Siddiqui
Senior Specialist
MARPOL and Engineering Systems
Marine Technology and Engineering Services
Lloyd's Register EMEA

Supplementary Type Approval Terms and Conditions

This certificate and Design Appraisal Document relates to type approval, it certifies that the prototype(s) of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein, it does not mean or imply approval for any other use, nor approval of any products designed or manufactured otherwise than in strict conformity with the said prototype(s).